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An update on the severe outbreak of HIV in Kot Imrana, Pakistan

Kot Imrana (Kot Momin) is a small village located in the district of Sargodha in Punjab province, Pakistan. During PCR-based screening by The Health Department at District Headquarter Hospital, Sargodha, in January 2019, 669 (13.38%) of the 5000 people who live in the village were found to be HIV-positive. In this journal, Muhammad Zaid and Muhammad Sohail Afzal¹ reported that the prevalence of HIV in the same village in June, 2018, was 1.29%. The HIV epidemic in Kot Imrana, therefore, continues to grow at an alarming rate with a substantially high mortality. Upon interviewing patients, a quack was found to have used the same syringe on multiple patients, and he himself died of AIDS later in 2018, leaving hundreds of patients HIV-positive. Prevalence was found to be higher in women and children. The detailed interviews of patients who visit our laboratory confirmed that more than 96% of HIV-positive patients were unaware of the modes of transmission of HIV and the

consequences of this life-threatening virus. The first case of HIV was reported in Kot Imrana around 15 years ago and now it is the most heavily affected region of Pakistan (a country in which more than 110 million people are at risk of infection), largely because it is located in Punjab, the largest and the most densely populated province of the country.

According to AIDS control programme data,² 5000 quacks working in Sargodha are transmitting the virus to the community. Additionally, barbers are the other source of HIV transmission because they use contaminated razors and blades. A substantial proportion of patients might have acquired the infection sexually, but they were reluctant in discussing their sexual relationships. According to local resources, the virus has been spread to nearby villages and about 900 HIV carriers are living in Sargodha. Discrimination and stigma associated with HIV/AIDS is another risk factor that makes elimination of HIV a challenge in socially conservative settings, such as Pakistan and other developing and under-developed countries.

Laboratory data from Genome Centre for Molecular Based Diagnostics and Research, Lahore, Pakistan, showed an increased prevalence of HIV in the Mardan region of the Khyber Pakhtunkhwa province. From this trend, we can conclude that Sheikhpura, Lahore, Faisalabad, and more than 50 villages in the vicinity of Sargodha, as well as more than 50 rural and urban areas in the outskirts of Mardan, are potential hotspots of HIV infection in Pakistan.

Scenarios suggest that the overall prevalence of HIV in the general population is underreported in Pakistan. The National AIDS Control Programme of the Government of Pakistan must develop innovative strategies and launch awareness campaigns to control HIV through increased access to screening, treatment, and counselling. This

HIV epidemic in Kot Imrana is unprecedented, having expanded from a prevalence of 1.29% to one of 13.38% in just 6 months. Focus on this high transmission area is urgently needed for the proper implementation of evidence-based prevention strategies to control the epidemic and reduce the transmission of virus.

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Yellow fever: is Asia prepared for an epidemic?

Epidemic arboviral diseases are relentlessly increasing in incidence, fueled by urbanisation, scarcity of effective disease and vector control strategies, and globalisation resulting in disease exportation.¹ This decade, the number of travellers exporting yellow fever virus to non-endemic countries is at a record high.² Furthermore, in 2016, for the first time in documented history, confirmed yellow fever virus was exported in travellers from Africa to Asia, where about 2 billion immunologically naive people live in areas inhabited by the *Aedes aegypti* mosquito vector and are at risk for transmission.³ The case-fatality rate of yellow fever is among the highest of all arboviral diseases, underscoring the threat of a newly emerging epidemic disease problem in Asia.

Why outbreaks of yellow fever have not yet occurred in Asia is unknown. The factors influencing transmission dynamics of yellow fever (eg, vector competence and magnitude and

duration of viraemia in humans) are similar to dengue, which has spread around the world aided by human travel. By contrast with dengue, most yellow fever infections in the past occurred when humans encroached the sylvatic cycle outside urban areas, and were not associated with a high risk of dispersal through air travel. However, major urban epidemics have occurred in both Africa and tropical America in the past decade. In parallel, we have seen an unprecedented growth in air travel intensity between Africa or Latin America directly to Asia.⁴ These factors combined increase the probability that travellers infected with yellow fever will introduce the virus to Asia at a time when conditions are aligned—ie, the presence of *Aedes* spp mosquitoes in an urban area during a suitable seasonal window. Application of the International Health Regulations (IHR), which require mandatory yellow fever vaccination for all travellers from yellow fever-endemic areas to permissive non-endemic areas, should prevent such introductions. However, hundreds of thousands of people have circumvented the IHR, as evidenced during the yellow fever outbreak in Angola,⁵ which should serve to highlight the need for action.

Is Asia prepared for a yellow fever epidemic? Many countries strengthened their pandemic preparedness capabilities in the wake of the 2009 influenza pandemic, guided by WHO. Country capacity building under the IHR, supported by the Joint External Evaluation, has increased preparedness and response capabilities to a range of public health threats. However, whether preparedness for epidemic vector-borne diseases such as yellow fever has been increased is uncertain.

Among the key issues that need to be addressed are the strengthening of laboratory-based surveillance capable of detecting imported yellow fever, effective vector control programmes, and plans to scale-up mass-vaccination

programmes, including the capacity to rapidly import vaccines, training of health-care workers to conduct such programmes, and clinical management of severe yellow fever disease.

We advocate for a call to action to urgently identify gaps and develop preparedness plans in all Asia-Pacific countries that are at risk of yellow fever virus introduction.

We declare no competing interests.

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Extensively drug-resistant typhoid fever in Pakistan

We read the Article by Farah Qamar and colleagues¹ about the outbreak of ceftriaxone-resistant *Salmonella enterica* serotype Typhi in Hyderabad, Pakistan, with great interest. *S Typhi* was observed as being twice as prevalent in the Qasimabad subdistrict of Hyderabad City (attack rate 15 per 1000 residents) as in the Latifabad subdistrict (seven per 1000 residents), two areas that differ

socioeconomically. In most cases, children younger than 15 years were affected.¹ The main reason for the outbreak was the mixing of drinking water and sewage in two subdistricts.¹

Up to 21 million people contract typhoid each year, often by consuming food or water contaminated by faeces, of whom up to 161 000 die.^{2,3} 3–6 cases of typhoid per 100 000 persons-years are estimated to occur in south Asia, which includes Pakistan.⁴ Among the 16 countries in Asia where typhoid is prevalent, inhabitants of the Punjab and Sindh provinces of Pakistan were at the highest risk of developing typhoid.⁴

Extensively drug-resistant typhoid fever is spreading in Pakistan, raising fears of antibiotic failure at global level.⁵ Experts believe that Pakistan's abysmal sewage and water systems coupled with low vaccination rates and overpopulated city dwellings are the root causes of the spread of extensively drug-resistant typhoid.^{3,6} In a 10-month period between 2016 and 2017, health authorities in Pakistan detected more than 800 cases of extensively drug-resistant typhoid in the city of Hyderabad alone.^{5,7} A new typhoid conjugate vaccine, Typbar-TCV, recently pre-qualified by the WHO, has been used by the public health officials in the province of Sindh to vaccinate 250 000 children in Hyderabad.² However, the local population is reluctant to use vaccination as rumours are circulating that vaccination is a foreign plot to poison Pakistan's children, and vaccinators face refusals almost every day.³

Extensively drug-resistant typhoid has the potential to spread globally by replacing less resistant strains where they are endemic.^{2,3,5,7} One remaining oral antibiotic, azithromycin, is still active against extensively drug-resistant typhoid; however, further genetic mutation could make typhoid untreatable in some areas.²

The provincial government of Sindh, Pakistan, which deals with the water and sanitation issues has